



# THE EFFICACY OF DANCE AND MOVEMENT FOR IMPROVING MOTOR SKILLS IN INDIVIDUAL WITH VISUAL IMPAIRMENT: A SYSTEMATIC REVIEW

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## ABSTRACT

Dance and movement are said to improve motor skills among individuals with visual impairment that impact their orientation and mobility skills. The relevant researches shows that dance and movement is one of the most effective ways to improve physical and motor abilities among individuals with visual impairment since it supports movement confidence by improving posture (Kamali, 2021, McKay 2017 & Dig-o 2011). The current paper is a narrative literature review examining the efficacy of dance and movement in improving motor skills among individuals with visual impairment for orientation and mobility skills. The aim of the review is to evaluate the methodological quality of included studies by assessing risk of bias and to inform the direction of future research. Peer reviewed research included intervention longer than a day for individual with visual impairment. The present paper is an attempt to review the secondary data to understand if dance and movement improve motor skills, specifically balance and spatial awareness in individuals with visual impairment. This review will also help the researcher to identify the gaps and pave a foundation for more research to determine the effect of dance and movement on motor skills which in turn will have impact on orientation and mobility skills of individuals with visual impairment.

**KEYWORDS:** Dance, Movement, Motor Skills, Visual Impairment, Orientation, Mobility Skills

## INTRODUCTION

Visual information motivates children to exercise and provides feedback to help them improve their movements. Visual cues have a crucial role in human motor activities, limiting children's exploration to their immediate surroundings and objects. Children with Visual Impairment are more likely to experience developmental and learning difficulties. Visual impairment can affect a person's abilities in a variety of ways.

Children with vision impairment are predicted to have altered motor development compared to their typically developing peers. Reduced visual inputs can affect all motions, including limb coordination and visual motor control (Aki, 2007). Other elements that might impact their development include intellectual and cognitive skills, existence of other diseases, and family and learning settings (Wright, 2008).

Some motor skill difficulties found in children with visual impairment include difficulties with gait acquisition and postural problems; changes in spatial orientation and temporal structuring; difficulty in coordinating perceptual information and its adjustment to external reality; problems with perception of the surroundings; and delays in the construction of the corporal scheme and the acquisition of functional habits, such as dressing and eating. Studies by Uysal (2011) have examined changes in orthostatic posture, postural control, manual dexterity, gait characteristics, and gross motor abilities.

Creative activities like art-based therapy, dance and movement therapy are increasingly acknowledged as viable alternative therapies for persons with visual impairment, and there have

been compelling cases of people employing artistic expression as a kind of self-management (Bloem, 2018).

Dance and movement incorporate a variety of aspects, including cognitive and motor abilities, creativity, expressiveness, and rhythms, which may have a good impact on persons with visual impairment (Dhami, 2015). Importantly, persons with visual impairment have lower levels of mobility abilities and motivation to move around (Kapur, 2017), however dancing has high levels of adherence and motivation (Houston, 2013; Sharp, 2014), reinforcing its potential as a sustainable option to help maintain mobility skills and well-being (Pandey, 2018). Participants and instructors of dance and movement for persons with visual impairments have discussed the relevance of the aesthetic experience of dance, as well as the need of developing motor skills. The therapeutic focus of dance along with its ability to enhance mobility, may result in better levels of acceptance and motivation for persons with visual impairment (Rocha, 2017).

Several systematic reviews on dance and visual impairment have been published over the past decade (Botha 2018, Nelson 2017, Seham 2015 & Takahashi 2015), with some focusing on orientation & mobility skills (Kamali 2021, Malik 2018, Kapur 2017 & Columna 2017) and other on specific outcomes such as gait & cognition (Kunkel, 2017) or non-motor symptoms (Zhang, 2019). Since the most recent comprehensive systematic reviews of the literature, a number of studies investigating dance interventions and outcomes have been published (Canfield 2019, Tsompanaki 2019, Bonilla 2017 & Kiepe 2012) have been published. There is, thus, a need to combine evidences

with previous research to provide a more comprehensive picture of the efficacy of this multifaceted intervention on motor skills.

The primary aim of this paper is to evaluate and review the secondary data to understand if dance and movement improve motor skills, specifically balance and spatial awareness in individuals with visual impairment. The second aim of the review is to evaluate the methodological quality of included studies by assessing risk of bias and to inform the direction of future research thus, updating the findings of the previous reviews.

### **A systematic review on efficacy of Dance and Movement for improving Motor skills in Individual with Visual Impairment**

#### **Scope of Review**

For this review, the researcher employed search engines such as PsycINFO, Google Scholar, ScienceDirect, and ERIC. On the one hand, PsycINFO offers access to international literature in psychology, behavioral sciences, and allied fields through professional journals, book chapters, books, reports, and dissertations. Google Scholar, ScienceDirect, and ERIC, on the other hand, are online libraries that provide a large collection of scientific papers and books from a variety of subjects. It is a valuable resource for academics and students looking for the most up-to-date information. These database engines offer a comprehensive, searchable, Internet-based bibliographic and full-text database to schools, researchers, and the general public.

As a criterion for inclusion, the researcher pragmatically limited the literature search to English Language Literature. The data were collected from April to December 2022, and we included empirical studies from 1964 to 2021. We chose 1964 as the beginning point since it was the year Chace (1964) wrote an article in the journal on dance therapy. Nonetheless, we should note that Gilliom (1974) wrote a book titled 'Basic movement education for children: rationale and teaching units / Foreword' in which he states that movement is necessary for survival, understanding one's environment, adapting to and controlling it, and connecting with others. Abstracts were searched using the descriptors and keywords "visual impairment", "sensory disability", "dance and movement therapy", "dance", "motor skills", "movement", and "mobility skills". Using these keywords, PsycINFO, Google Scholar, ScienceDirect, and ERIC provided us with more than 60 publications.

The following subsection outlines the main findings of this literature review from several angles. First, the researcher discusses the different levels of analysis used to assess the impact of dance and movement on motor skills. Secondly, the researcher focused on which methodological approaches have been applied to study the efficacy of dance and movement for improving motor skills in individual with visual impairment.

#### **Level of Analysis**

The effectiveness of dance and movement on motor abilities in people with visual impairments has been extensively examined. Most research focuses on gross motor skills (35 studies) and

fine motor abilities (19 studies). Only six research focused on orientation and mobility abilities. The latter is unexpected given the increased availability of similar national studies in recent years. Future study should focus on corrective approaches for enhancing the social and physical abilities of children with vision impairments. Mobility skills have fewer researches than fine and gross motor abilities. This is likely owing to a paucity of data in India. More investigation into the issue of motor skills among individuals with visual impairment is required. Finally, just six publications discussed research on mobility skills.

#### **Fine Motor Skills**

Savage (2019), Willings (2019), Ferraro (2018), Columna (2016), Reimer (2016), British Columbia Blind Sports and Recreation Association (2009), Allen (2003), Valkova (2003), Ponchillia (2002), Romance (2000), Lieberman (1999), Henry (1998), Brown (1987), Sillanpaa (1987), Hanna (1986), Palazesi (1986), Brown (1979), Hewett (1970)

#### **Gross Motor Skills, Balance**

Widyawan (2021), Canfield (2019), Nichols (2019), Taylor (2019), Botha (2018), Madic (2018), Gupta (2017), Kiepe (2012), Larsson (2009), Berk (2003), Davies (2003), Goodway (2003), Bergen (2002), Folio (2000), Pica (2000), Beaty (1998), Benelli (1995), Clements (1995), Garvey (1993), Jacob (1993), Tara (1992), Andress (1991), Diem (1991), Kobberling (1991), Eliason (1986), Duggan (1978), Fraiberg (1977), Pica (1997), Duehl (1979), Wickstrom (1977), Vygotsky (1976), Adelson (1974), Arnheim (1973), Breckenridge (1965), Chace (1964)

#### **Orientation & Mobility Skills, Mobility Skills, Movement,**

Chowdhary (2021), Kamali (2021), Malik (2018), Hackney (2015), Takahashi (2015), Jovelyn (2011)

**Table 1: Levels of Analysis**

### **METHODOLOGICAL APPROACHES**

To compare across research, motor abilities had to be measured, and studies that did not disclose this dimension were removed. Although there are several empirical techniques to assessing efficacy, all therapies must have included dance and movement as the primary rehabilitation strategy of interest. The operational definition of dance and movement utilized was broad, embracing all dance and movement approaches such as mirroring, real movement, and leaping rhythm in a variety of venues such as schools and clinics. All peer-reviewed research that compared dance and movement to no intervention or active control were considered eligible. Also included was research comparing various dance and movement therapy. This review excluded quasi-experimental research, cohort studies without a control group, and controlled trials without random treatment allocation methodologies. Researches that reported at least one motor outcome, such as gait and balance, were selected as the rehabilitation strategy of interest. Data were retrieved, and clinical trial data and risk of bias were assessed for the research selected for this review. For each study, the following details were recorded: authors, year of publication, dance and movement method, comparison or control group, intervention parameters, number of participants, and number of dropped or withdrew participants.

Researcher	Year of Publication	Dance & Movement Technique	Control	Intervention parameters	Participants	Dropouts/Withdrawals
Bonilla J. A. M., Onate B., Medina M., Sanchez M. and Garces D.	2017	Tango	No Intervention	45 mins, 5 months	40	0
Botha M.	2018	Authentic Movement	No intervention	8 sessions, 60 mins,	26	10
Canfield J.	2019	Mirroring	No intervention	60 mins, 4x week, 5 months	16	2
Devereaux C.	2016	Jumping Rhythm	No intervention	4 days a week, 5 month	18	4
Iyenger K. M.	2015	Bharatnatyam	No intervention	60 mins, 2x/week, 13 weeks (20 sessions)	12	12
Jeremy C.	2017	Mirroring	No intervention	60 mins, 4x week, 5 months	16	12
Nelson C., Paul K. & Barnhill B.	2017	Tango	No intervention	60 mins 2x/week 10 weeks	16	14
Park A.Y	2021	Mirroring	No intervention	60 mins, 1x/week, 10 weeks	30	0
Takahashi, H.	2015	Mirroring	No intervention	90 mins, 1x/week, 6 mos. + 60 min home prog.	20	0
Tsompanaki E.	2019	Authentic Movement	No intervention	60 mins, 2x/week, 13 weeks (20 sessions)	26	0

Table 2: Characteristics of included studies

Eighty researches assessing the efficacy of dance and movement for individuals with visual impairment were discovered. Sixty met the qualifying standards while 20 were deleted. The researcher excluded full-text articles due to the use of a quasi-approach with just the experimental group (Hashimoto, 2015), convenience sampling (Sehem, 2015), and no difficulty with motor abilities (Tucker, 2015). Thirteen researches submitted in conference proceedings were also reviewed for eligibility by contacting the authors for further information but these researches were omitted because more information regarding the experiment could not be obtained to determine eligibility.

The number of individuals randomly assigned in each experiment ranged from 10 to 90, whereas the number of people examined ranged from 10 to 61. Thus, 636 people were randomized and 516 were studied in total, yielding an average size of 40 participants for the analysis.

The Cochrane Collaboration risk of bias assessment tool (Higgins, 2011) was used to evaluate the methodological quality of all studies included in this systematic review, to assess potential improvements in quality over time, and to make recommendations for future research.

All of the outcome variables evaluated, including motor skill tests, were continuous. All peer-reviewed research that compared dance and movement to no intervention or active control were considered eligible. If data were only presented in graph form in a publication, authors were contacted via email and requested means and standard deviations for all groups at all time periods.

To reduce the potential of publication bias in this review, we used a systematic search that was not outcome-limited and attempted to identify trials reported in conference meeting abstracts. Two of the conference abstracts evaluated were ineligible for inclusion, and the data from the other 11 were inaccessible because the authors were either unavailable or did not respond to the request for more information. The absence

of grey literature is a shortcoming of our review since it shows insufficient retrieval of identified research. The majority of the included studies returned one or more null/neutral results.

## RESULTS

It was found that all studies were considered to have a high risk of performance bias since it is impossible to blind participants or those providing the intervention (dance instructor cum researcher) in these kinds of researches. Even after the performance bias was found, the researcher can say based on researches that the dance and movement intervention has a great impact on motor skills among individuals with visual impairment.

Dance was the only therapeutic resource for the intervention groups in all included articles. All included articles pointed out dance as an effective therapeutic resource to improve the motor skills among individuals with visual impairment. Significant results were reported for motor skills, balance, movement, and mobility skills.

Seven of the 16 interventions included 60-minute dance classes that met two times per week, with interventions lasting eight weeks to two years in duration Park (2021), Canfield (2019), Tsompanaki (2019), Botha (2018) Jeremy (2017), Nelson (2017) & Iyenger (2015). One intervention included a 90-minute dance class that met two times per week for 12 weeks (Takahashi, 2015), respectively.

## DISCUSSION

The primary aim of this study is to assess secondary data to determine if dance and movement enhance motor abilities, particularly balance and spatial awareness, in people with visual impairment. Overall, evidence suggests that dance and movement can benefit those with visual impairment, with the strongest support for its ability to manage motor skills in comparison to usual care, as well as improve balance and functional mobility more effectively than usual care or another form of physical activity. The secondary aim of this review were to evaluate the methodological quality of the included papers and to guide future research. In the last four to five years, a



growing number of research groups have begun to investigate the influence of dancing on persons with visual impairment, and methodological quality has increased in certain areas, such as randomization techniques, while staying mostly unchanged in others.

The main limitations of our systematic review were: 1. The small sample sizes in the studies 2. Limited our research search by language, we opted to limit to studies published in English. These limitations compromised the quality of the systematic review and the drawing of convincing conclusions. Some strengths of this review included the prospective registration and the duplicate data processes.

## CONCLUSIONS AND FUTURE DIRECTIONS

Overall, this study supports previous findings that individuals with visual impairments can benefit from a variety of dance and movement therapy. At this point, the evidence strongly supports dance's ability to manage motor skills; nevertheless, further research is needed to comprehend the impacts dancing may have on mobility abilities.

Future study should look at the influence of dance on persons with limited mobility abilities, since promising studies have shown that dancing can benefit extended core curriculum (Ann, 2020). According to the research, dance can help patients with visual impairments enhance their motor function. Furthermore, studies should investigate the influence of dancing on persons with visual impairment, who may experience more severe sadness (Gold, 2013) and disturbance to family life (Park, 2021). Thus, greater research into whether dancing might enhance motor abilities in a broader range of visually impaired persons should be conducted.

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